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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

VO, LILIAN

ART UNIT PAPER NUMBER

2195

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/917,525

Applicant(s)

SOKOLOV ET AL.

Examiner

Lilian Vo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 3, 5 - 10, 12 - 17 and 19 - 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 3, 5 - 10, 12 - 17 and 19 - 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1 – 3, 5 – 10, 12 – 17 and 19 - 21 are pending. Claims 4, 11 and 18 have been canceled.

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/3/05 has been entered.

Claim Rejections - 35 USC § 101

3. Claims 15 – 17 and 19 – 21 are rejected under 35 U.S.C. 101 because they are directed to non-statutory subject matter.

4. Regarding **claims 15 – 17 and 19 – 21**, the apparatus is at best a software system, per se, failing to be tangibly embodied or include any recited hardware as part of the apparatus.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 6 - 8, 13 - 15 and 20 - 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Summer, Jr. et al. (US 4,414,624, hereinafter Summer) in view Bayeh (US 6,223,202).

7. Regarding **claim 1**, Summer discloses a method to facilitate suspending tasks/threads in a platform-independent virtual machine implemented on an operating system that lacks a global mechanism for suspending tasks/threads, comprising:

scheduling a task/thread to execute that requires other tasks/threads to be suspended during execution (col. 15, lines 3 - 22); and

in response to scheduling the thread (col. 15, lines 8 - 10),

changing a scheduling policy for the task/thread (col. 15, lines 1 - 19); and

raising a priority of the task/thread to a highest available priority, whereby

changing the scheduling policy and raising the priority of the task/thread causes the thread to run to completion while other tasks/threads do not run (col. 15, lines 3 - 22).

Summer however did not use the term threads. Instead, he uses the term tasks, which is partitioned from the whole program (col. 4, lines 9 - 11 and fig. 1). It would have been obvious for one of an ordinary skill in the art, at the time the invention was made, to relate the concept of a task with the concept of a thread, since the task as referred to in Summer is also a part of the program that can be executed independently of the other parts like a thread.

With respect to the limitation changing the scheduling policy for the thread includes changing the scheduling policy from round-robin to first-in-first-out, Summer discloses of

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preemptive scheduling (col. 14, lines 37 – 39 and col. 15, lines 12 – 17) which also called time-slice scheduling, and that a task priority can change to a higher priority and interrupt the current execution task which allow it to run to completion before switching to another task (col. 15, lines 1 – 17). Additionally, Bayeh discloses the operating system maintains information about each concurrent thread that enables the threads to share the CPU in time slices (col. 2, lines 44 – 50, col. 11, lines 15 - 19) and that if the operating system invokes garbage collection, then execution of application programs to process client requests will halt until the garbage collection is finished (col. 3, lines 3 – 6, col. 11, lines 40 - 45). It would have been obvious for one of an ordinary skill in the art, at the time the invention was made, to incorporate Bayeh's teaching together with Summer so that scheduling of threads/tasks with higher priority can be performed effectively with changing from one policy (time slice) to another policy (FIFO) as appropriated.

8. Regarding **claim 6**, as modified Summer discloses the platform-independent virtual machine includes a Java Virtual Machine (Bayeh: col. 2, lines 1 – 65).

9. Regarding **claim 7**, as modified Summer discloses the step of performing a garbage collection with the thread (Bayeh: col. 3, lines 3 – 6, col. 11, lines 40 – 45).

10. **Claims 8, 13, 14, 15, 20 and 21** are rejected on the same ground as stated in claims 1, 6 and 7 above.

11. Claims 2, 9 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Summer, Jr. et al. (US 4,414,624, hereinafter Summer) in view Bayeh (US 6,223,202), as applied

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to claims 1, 8 and 15 above, and further in view of Cutler et al. (US 5,752,031, hereinafter Cutler).

12. Regarding **claim 2**, as modified Summer did not clearly disclose the additional limitation as claimed. Nevertheless, Cutler discloses the step of upon completion of the thread, reducing the priority of the thread to an assigned priority and returning the scheduling policy of the thread to an assigned scheduling policy (col. 9, lines 29 – 44: each thread also has a dynamic priority). It would have been obvious for an ordinary skill in the art, at the time the invention was made to incorporate Cutler's teaching with Summer and Bayeh so that a thread priority can be dynamically changed as necessary depending on the type of the work the thread is performing.

13. **Claims 9 and 16** are rejected on the same ground as stated in claim 2 above.

14. Claims 3, 5, 10, 12, 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Summer, Jr. et al. (US 4,414,624, hereinafter Summer) in view Bayeh (US 6,223,202), as applied to claims 1, 8 and 15 above, and further in view of Applicants' admitted prior art (hereinafter AAPA).

15. Regarding **claim 3**, as modified Summer discloses the thread requiring other threads to be suspended (Summer: col. 15, lines 3 – 11). Summer and Bayeh however did not disclose the suspended threads include a garbage collection thread. Nevertheless, AAPA discloses that while the other threads are halted, the garbage collection or other uninterruptible task runs to completion (specification page 2, paragraph 5). It would have been obvious for one of an

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ordinary skill in the art to recognize that if the other uninterruptible task that runs to completion, then the collection garbage thread could be included as one of the other threads that were suspended. It would have been obvious for one of an ordinary skill in the art, at the time the invention was made, to incorporate AAPA concept with Summer and Bayeh so that any threads/tasks can be executed until completion as required or be suspended when necessary.

16. Regarding **claim 5**, as modified Summer did not disclose the additional limitation as claimed. Nevertheless, AAPA discloses the operating system that lacks the global mechanism for suspending threads includes POSIX (specification page 2, paragraphs 3 and 5). It would have been obvious for an ordinary skill in the art, at the time the invention was made, to incorporate Agape's teaching with modified Summer because Summer is implemented with virtual machines (fig. 2) while operating systems with POSIX thread also include the same basics services to those platform-independent machines.

17. **Claims 10, 12, 17 and 19** are rejected on the same ground as stated in claims 3 and 5 above.

Response to Arguments

18. Applicant's arguments filed 3/3/05 have been fully considered but they are not persuasive for the reason set forth below.

19. In response to applicant's argument that the references fail to suggest changing the scheduling policy and the priority of a task in response to scheduling a thread to execute which

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requires other threads to be suspended during execution (page 8, 2nd paragraph), the examiner disagrees. Summer teaches that when a task is placed in a ready state and executed as soon as it become the highest priority task. In other words, when a thread in a ready state means it's scheduled. Once it's scheduled, it'll be executed/run after its priority changed. Summer also discloses of preemptive scheduling, which interrupt the execution of a task to run a higher priority task (col. 15, lines 13 – 16). It is obvious that the changing of scheduling policy and the priority of task is done/happened when the thread is scheduled to run, thus in responsive to the scheduling of the task. Therefore, this argument is moot.

20. With respect to applicant's remark that the combined references providing a supervisor call to modify task priority but never changes a priority without external direction from a user because the priority of a task is considered to be a user-controlled policy and not a system function (page 7, 4th paragraph), it is noted that the features upon which applicant relies (i.e., system function for changing the priority) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Furthermore, Bayeh discloses the changing the thread priority is done by the system function in which he teaches if the operating system invokes garbage collection, then execution of application programs to process client requests will halt until the garbage collection is finished (col. 3, lines 3 –6, col. 11, lines 40 - 45). It is obvious that when a GC thread has to be scheduled before it can run. When it executes its priority changes to a higher priority than the other currently running threads/processes.

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Conclusion

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lilian Vo whose telephone number is 571-272-3774. The examiner can normally be reached on Monday - Thursday, 7:30am - 5pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist at 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lilian Vo
Examiner
Art Unit 2127

lv
May 27, 2005


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SUPERVISORY PATENT EXAMINER
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